



REDUCTION OF NITROUS OXIDE EMISSIONS FROM NITROGEN FERTILISER DUE TO THE USE OF UREASE INHIBITORS

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Main Purpose: ☒ Decide ☒ Discuss ☐ Note

Purpose of Report

1. Seek approval from the Agricultural Inventory Advisory panel to include the use of urease inhibitors in the National Inventory Report.
2. Attached to this paper are the reports
 - a. *“Desktop study of emission factors for urease inhibitors for nitrogen fertiliser” – Final report.*
 - b. *“Reductions in $Frac_{gasm}$ and $Frac_{gasf}$ in the GHG inventory when urease inhibitor has been applied to the soil and with N fertiliser” – Final report.*
 - c. The change approval form completed by the reviewer Keith Smith. Keith did not write a separate report on the review.

Summary

Background

3. New Zealand has an obligation under United Nations Framework Convention on Climate Change Convention (UNFCCC) to report the anthropogenic greenhouse gas emissions and removals every year. Emissions are reported in the annual submission of the National Inventory Report submitted to the UNFCCC. New Zealand also has a responsibility under the Kyoto Protocol to reduce emissions growth and if not successful will incur a financial cost.
4. The National Inventory Report forms the base of any financial cost that the country may have under the Kyoto Protocol. Therefore reported emissions and removals need to be as accurate as possible. New Zealand has a long standing research program in estimating country specific emission factors to aid in the improvement of reported emissions and removals from the land based sectors.

5. Changes beyond the default methodology and emission factors to take account of country specific factors are encouraged and need to be well documented and transparent.

Current Inventory

6. There is no guidance from any of the IPCC guidelines on how to include mitigation technologies into the National Inventory Report (NIR).
7. However, New Zealand included the use of a nitrification inhibitor, Dicyandiamide (DCD), in the 2009 submission of the NIR.
8. This was reviewed by a UNFCCC Expert Review Team (ERT) in 2009 during a centralised review. It was reviewed again in an in-country review in 2010.
9. New Zealand was commended for the incorporation of mitigation technologies such as DCD in the NIR in the 2010 review.

Report

10. Two reports have been completed on the use of Urease Inhibitors (UI) with fertiliser. The second report "*Reductions in $Frac_{gasm}$ and $Frac_{gasf}$ in the GHG inventory when urease inhibitor has been applied to the soil and with N fertiliser*" concluded that there was no new information available for UI use with fertiliser since the original report "*Desktop study of emission factors for urease inhibitors for nitrogen fertiliser*". Therefore they had no new recommendations but did suggest a way in which UI use can be incorporated into the inventory. This is similar to how DCD is currently incorporated.
11. The second report also reviewed the use of UI with animal manure. However, due to the lack of robust information for the UI effect on reducing emissions from animal manure, the report has not recommended any changes to $Frac_{gasm}$.
12. This briefing therefore concentrates on the change to $Frac_{gasf}$ which the first report "*Desktop study of emission factors for urease inhibitors for nitrogen fertiliser*" recommended and was reviewed by Keith Smith.

Proposed changes to inventory

13. The reports recommend that the $Frac_{gasf}$ value should be reduced from 0.1 to 0.06 where fertilisers containing urease inhibitors are applied.
14. In 2010 Statistics New Zealand started to collect information on UI use on farm. Until such time as a time series can be determined, the fertiliser industry will provide data on sales of UI coated fertiliser.

Implications for emissions estimates

15. At the current rate of UI use in New Zealand, incorporation of this mitigation technology into the Inventory would reduce emissions from fertiliser use by 3.6 Gg CO₂-e.

Reviewer comment

16. The reviewer supports the recommended value of 0.06 to be used where fertilisers containing urease inhibitors are applied.
17. The reviewer felt that there was clear experimental evidence to back this recommendation.

Strategic Risks

18. The changes may not be accepted by the *United Nations Framework Convention on Climate Change* (UNFCCC) reviewers. However, if this is the case there is an extensive process which is followed in which New Zealand can state its case or change back to the IPCC default before any penalty would be applied.

Strategic Opportunities

19. New Zealand will be meeting the UNFCCC obligations of continual improvement of the National inventory.
20. Although the new values will not make any noticeable difference to the total emissions estimate for New Zealand, the values used will now be well documented, therefore meeting the UNFCCC requirement for transparency.

Recommendations

It is recommended that the Agricultural Inventory Advisory Panel:

21. **Agree** that the $Frac_{gasf}$ value should be reduced from 0.1 to 0.06 where fertilisers containing urease inhibitors are applied.

Agree / not agreed

Andrea Pickering
Senior Policy Analyst

Approved/ Not Approved/ Approved as Amended

Alice Marfell-Jones
Manager Information and Analysis
Chair Agricultural Inventory Panel

Date